



# Energy Data & Modeling

January 26<sup>th</sup>, 2016

Kentucky Energy and Environment Cabinet  
Department for Energy Development and Independence

[energy.ky.gov](http://energy.ky.gov)

# Kentucky Energy Profile

5th Edition • 2015



Kentucky Energy and Environment Cabinet  
Department for Energy Development and Independence

[energy.ky.gov](http://energy.ky.gov)

**Download at:**

<http://energy.ky.gov/Pages/Profile.aspx>

**Purpose:**

Comprehensive Report on Energy Production, Energy Consumption, and Energy Dynamics within the Commonwealth of Kentucky

**Contains:**

- Energy Commodity Prices and Expenditures
- Energy Production and Consumption
- Energy Consumption, Expenditures, and Intensity by Sector
- Electricity Generation, Consumption, Prices, Generation Infrastructure, Rates, and Service Areas
- Profiles of Electricity Utilities in Kentucky
- Profiles of Coal-Fired Power Plants in Kentucky
- Coal Production and Consumption
- Natural Gas Consumption and Production
- Crude Oil Production and Liquid Fuel Consumption
- Renewable Energy Production, Generation, and Potential

# Kentucky Coal Facts

15th Edition • 2015



*Produced by the*  
Kentucky Energy and Environment Cabinet  
Department for Energy Development and Independence

*In Partnership with the*  
Kentucky Coal Association

energy.ky.gov  
kentuckycoal.com

## Download at:

<http://energy.ky.gov/Pages/CoalFacts.aspx>

## Purpose:

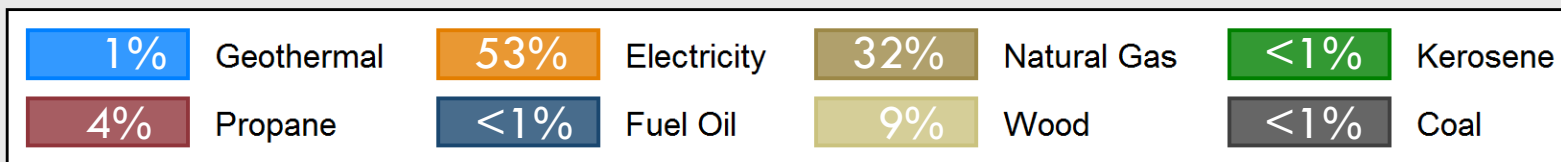
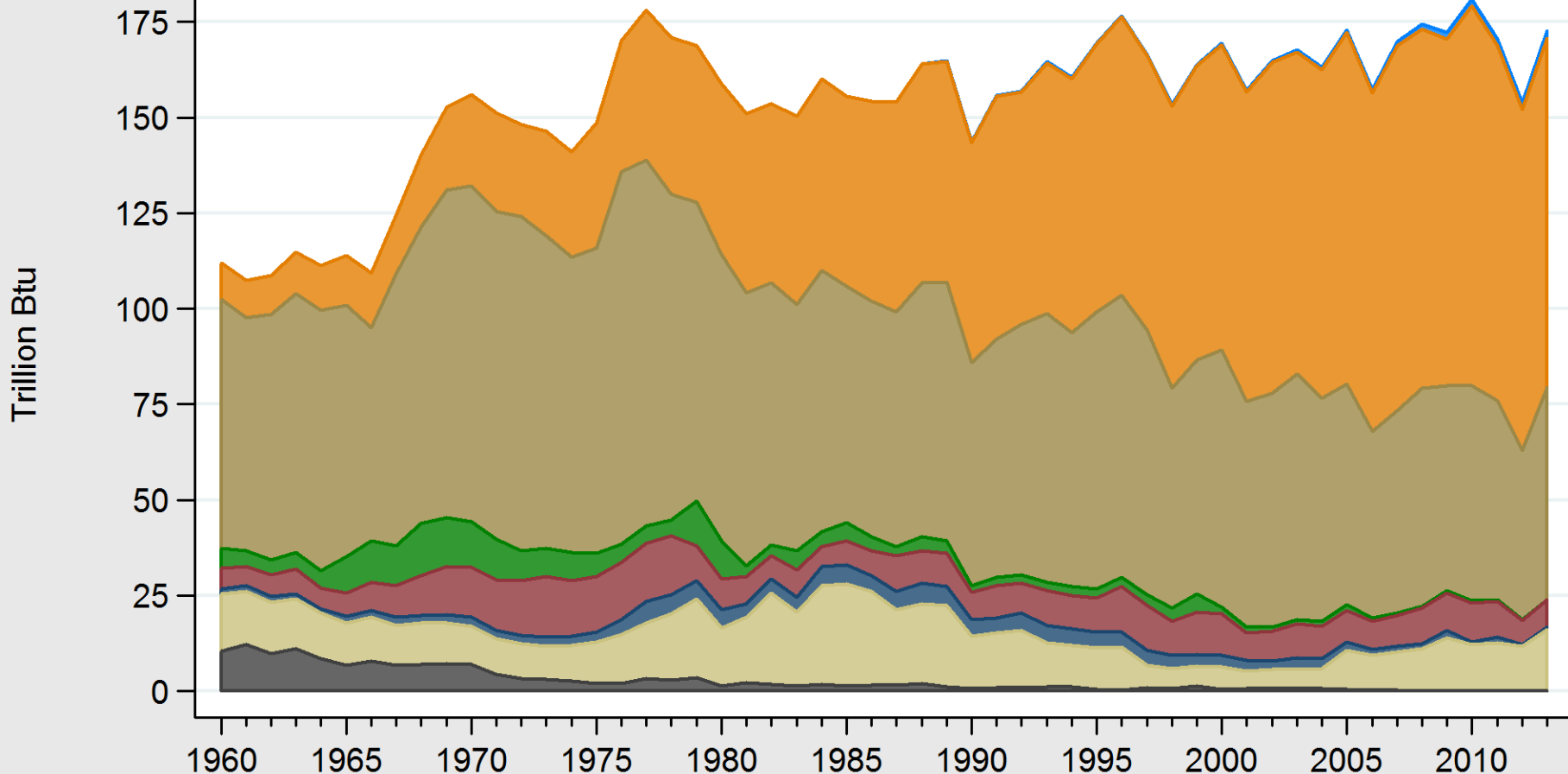
A detailed overview of the coal industry in Kentucky, focusing on mining and production, employment, and the markets for Kentucky coal.

## Contains:

- Coal Production
- Mining Employment and Productivity
- Severance Revenue, Coal Prices, and Chemical Properties
- Coal Distribution and Markets
- Electricity Generation, Emissions, and Prices
- History of Coal in Kentucky
- Mine Safety, Licensing, and Reclamation
- County Level Production, Employment, and Markets

# Kentucky Residential Energy Consumption by Fuel, 1960-2013

*Residential energy consumption has grown little since the late 1970s. Electricity has grown, natural gas has declined.*

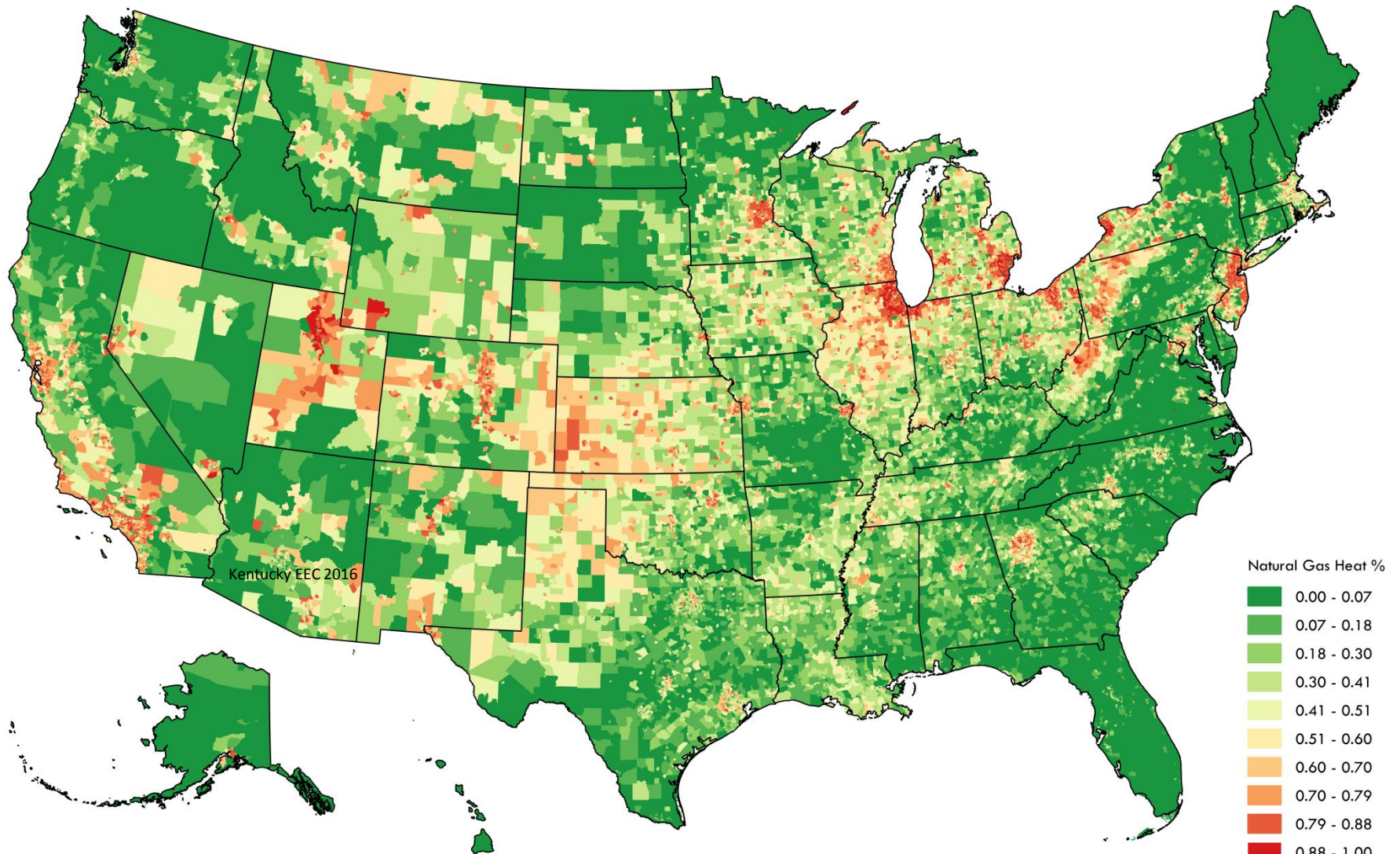


Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA-SEDS



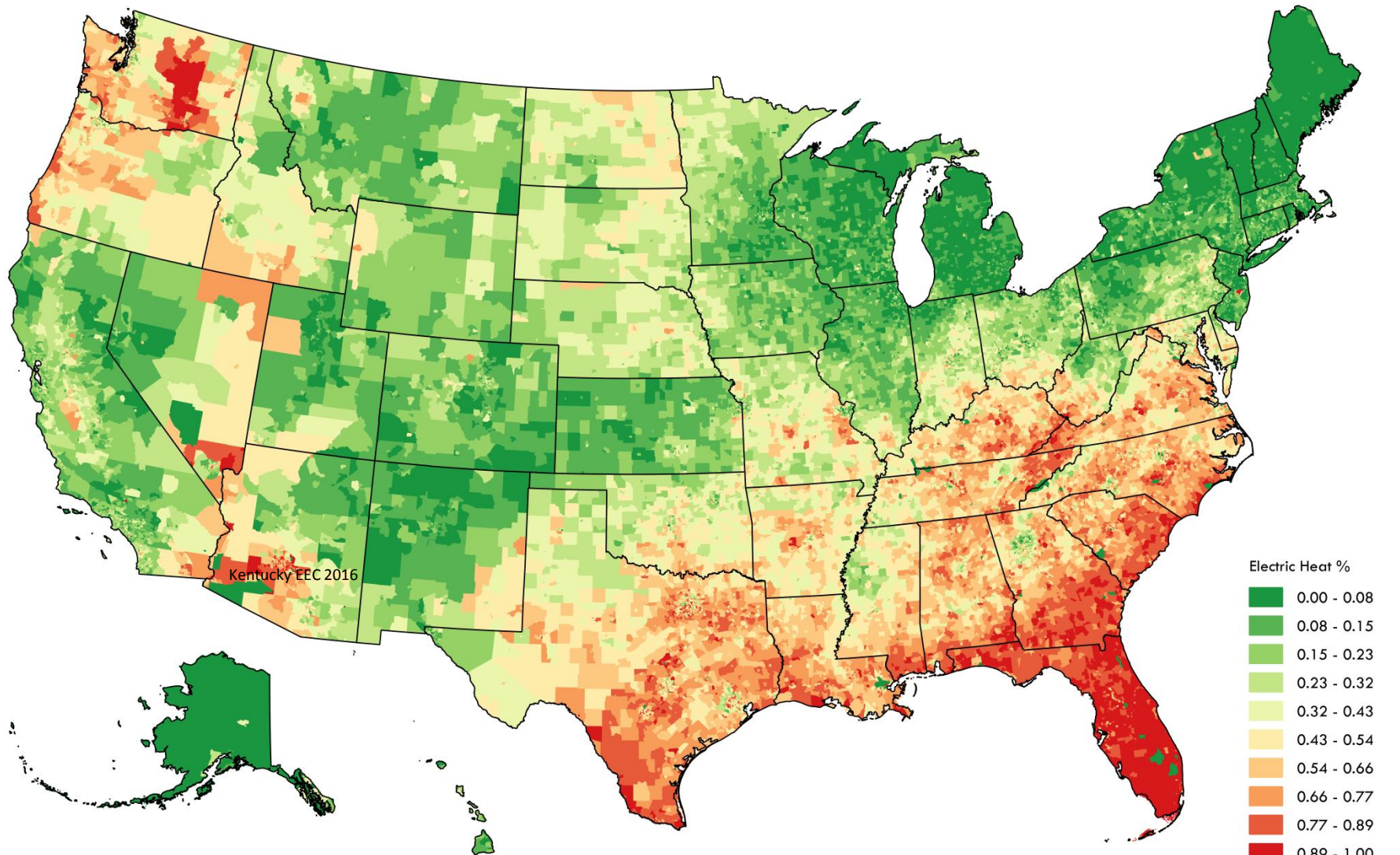
# United States Natural Gas Use for Home Heating, 2014



Data Source: United States Census Bureau, American Community Survey

Kentucky Energy Database, EEC-DEDI, 2015

# United States Electricity Use for Home Heating, 2014

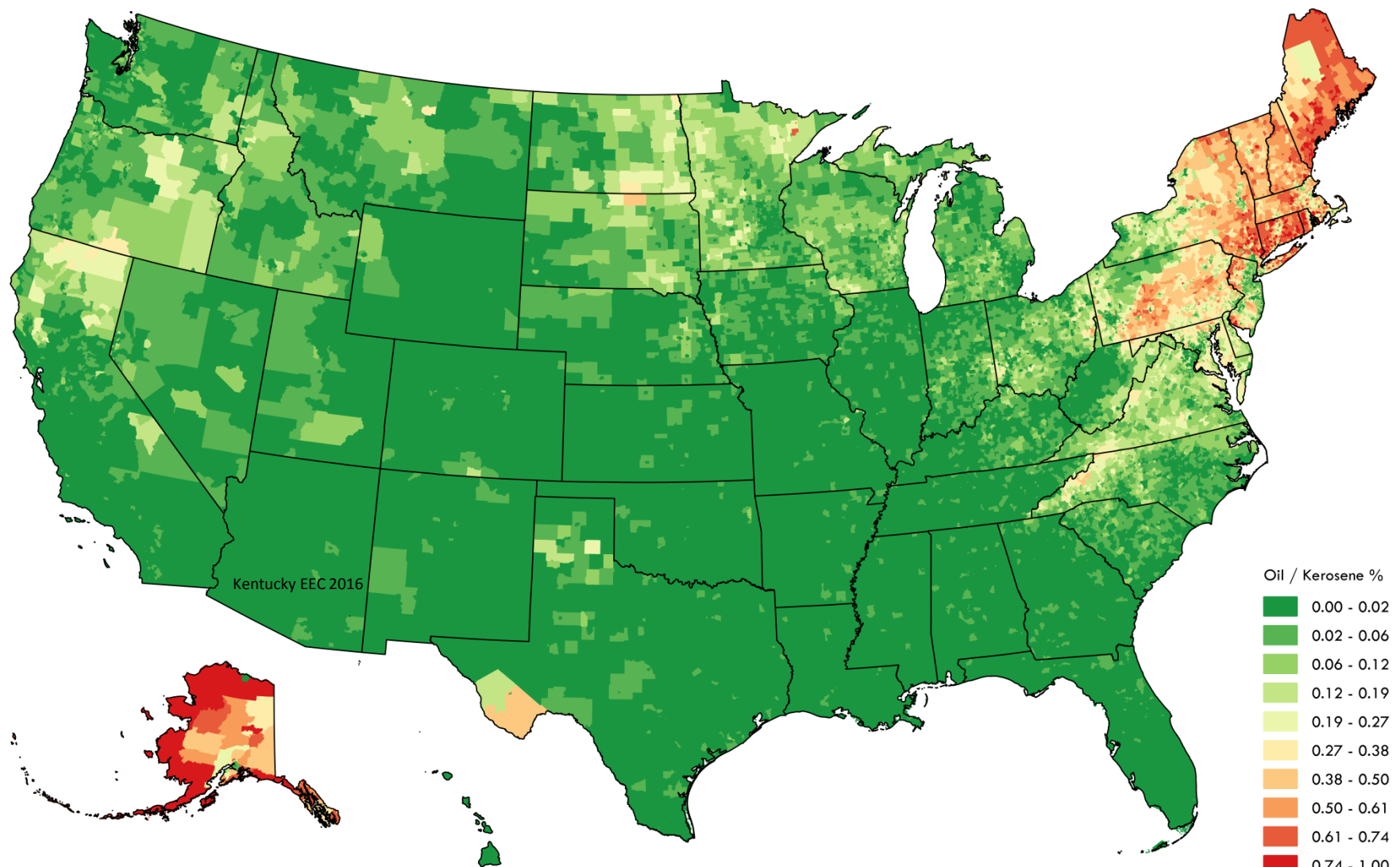


Data Source: United States Census Bureau, American Community Survey

Kentucky Energy Database, EEC-DEDI, 2015



# United States Fuel Oil & Kerosene Use for Home Heating, 2014

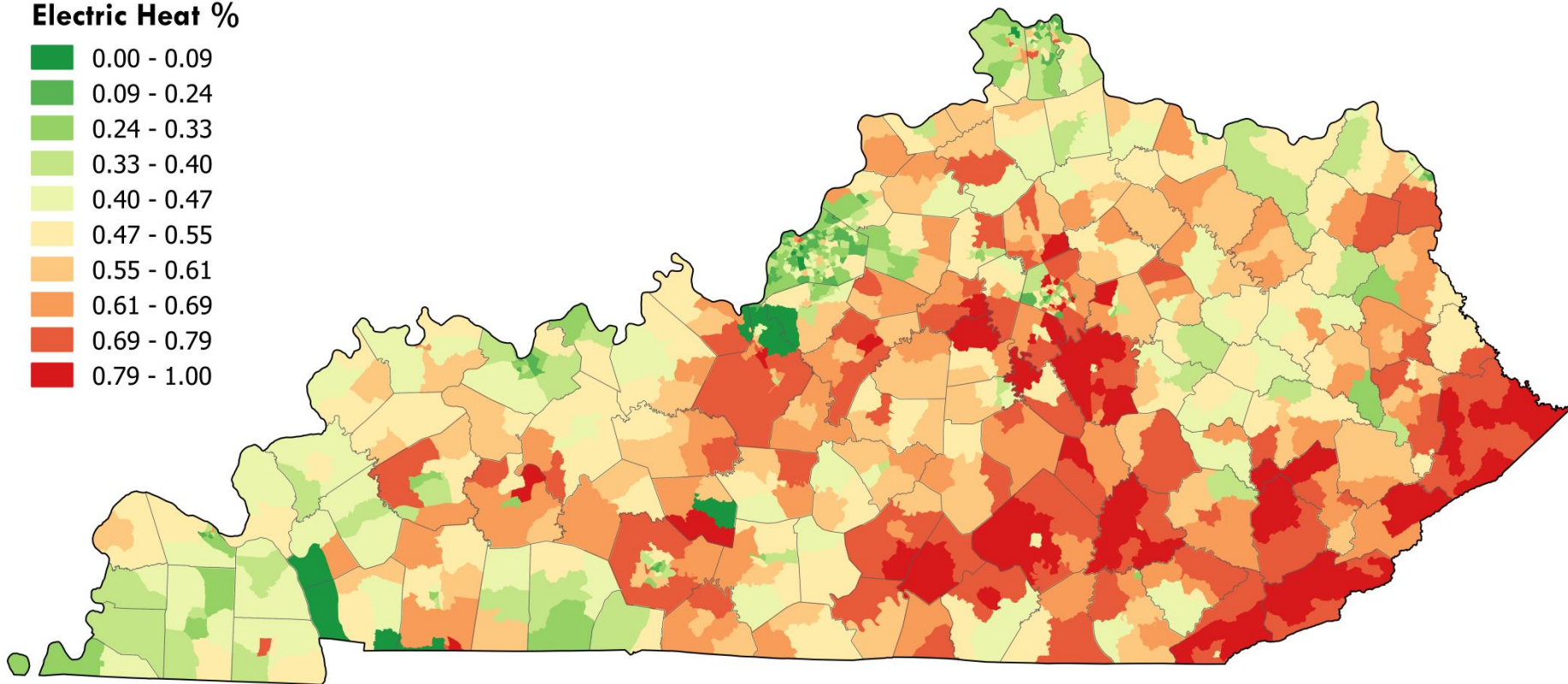
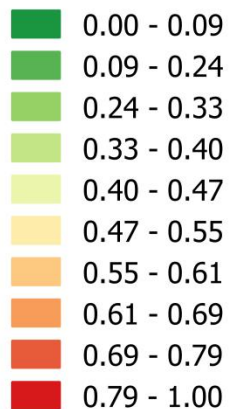


Data Source: United States Census Bureau, American Community Survey

Kentucky Energy Database, EEC-DEDI, 2015

# Kentucky Homes Heating with Electricity, 2014

## Electric Heat %

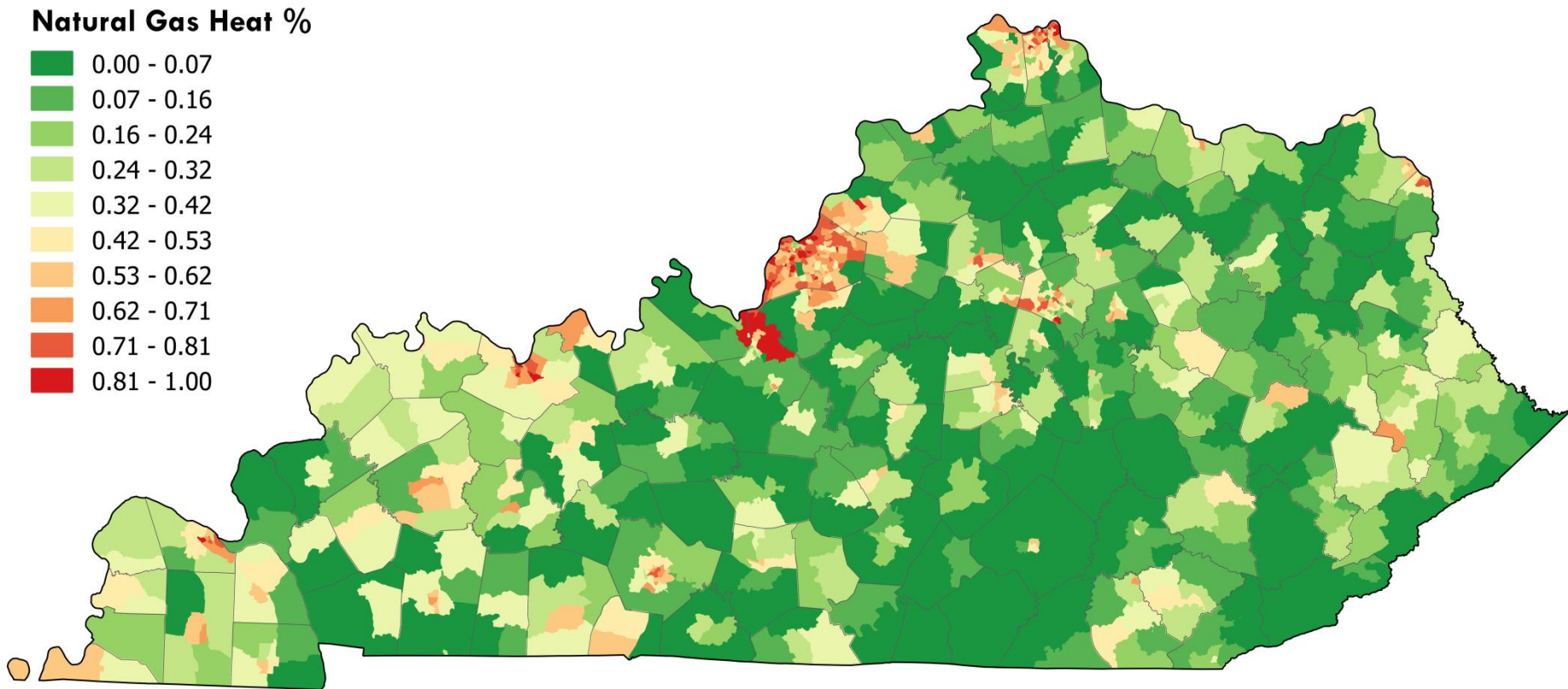


Kentucky Energy Database, EEC-DEDI, 2016

859,587 (50.5%) or Kentucky Families Heat with Electricity



# Kentucky Homes Heating with Natural Gas, 2014

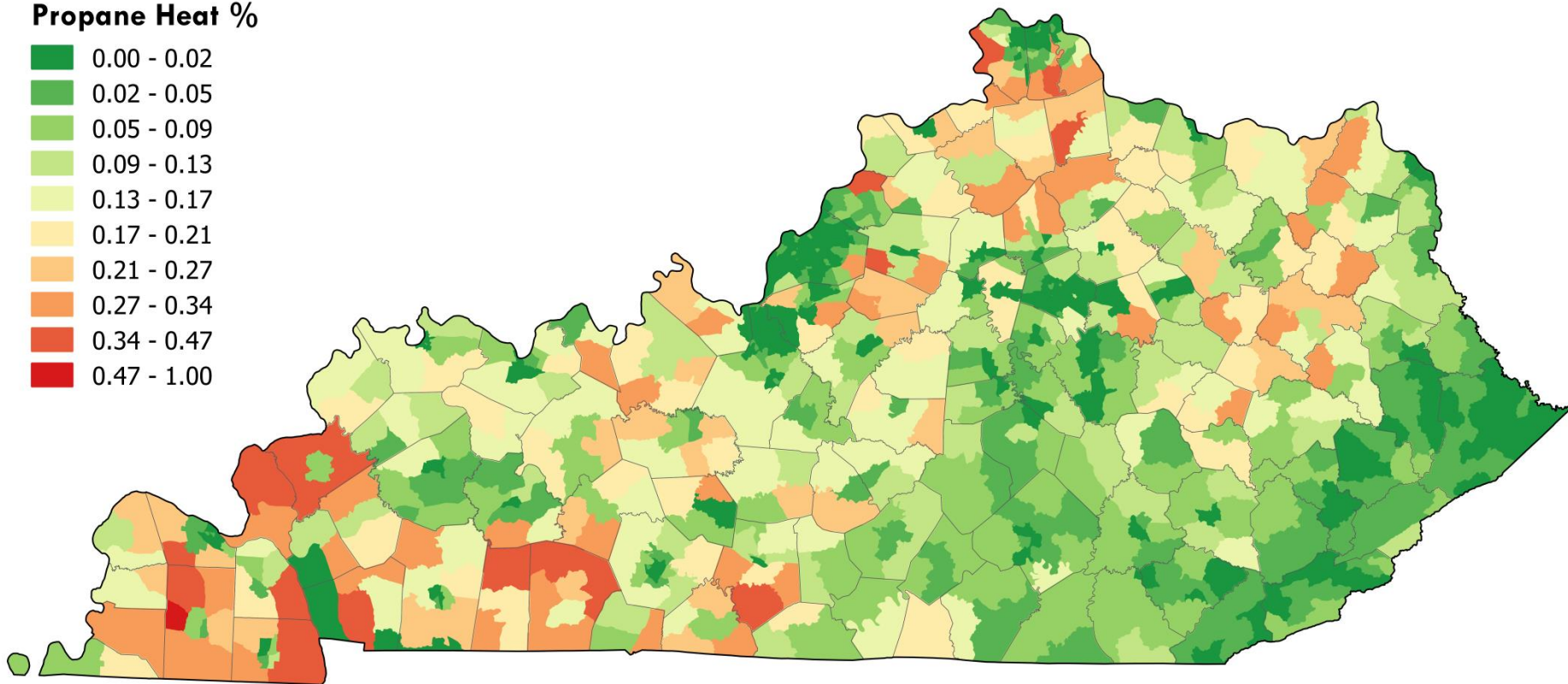
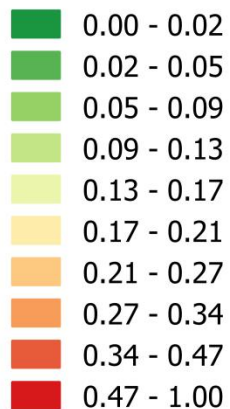


Kentucky Energy Database, EEC-DEDI, 2016

650,672 (38%) or Kentucky Families Heat with Natural Gas

# Kentucky Homes Heating with Propane, 2014

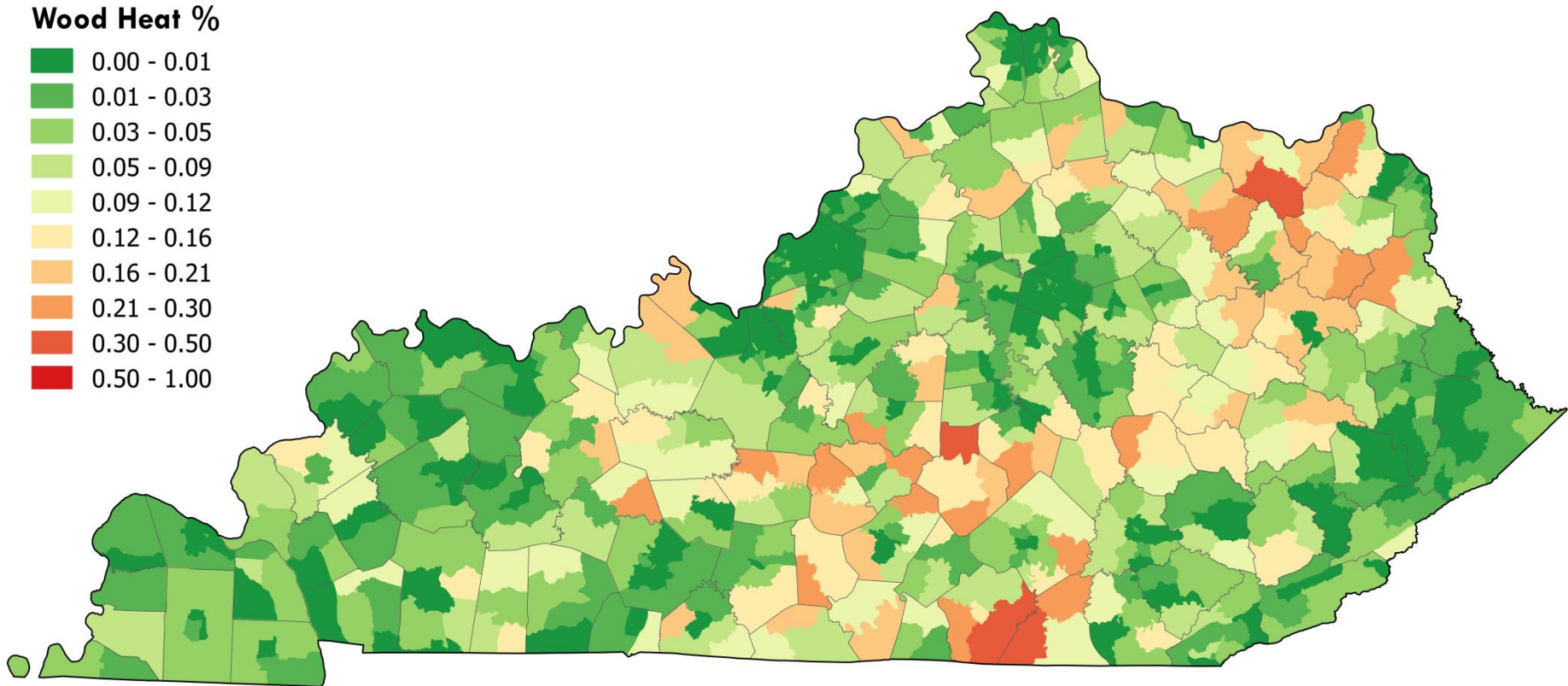
## Propane Heat %



Kentucky Energy Database, EEC-DEDI, 2016

50,270 (6.5%) or Kentucky Families Heat with Propane

# Kentucky Homes Heating with Wood, 2014

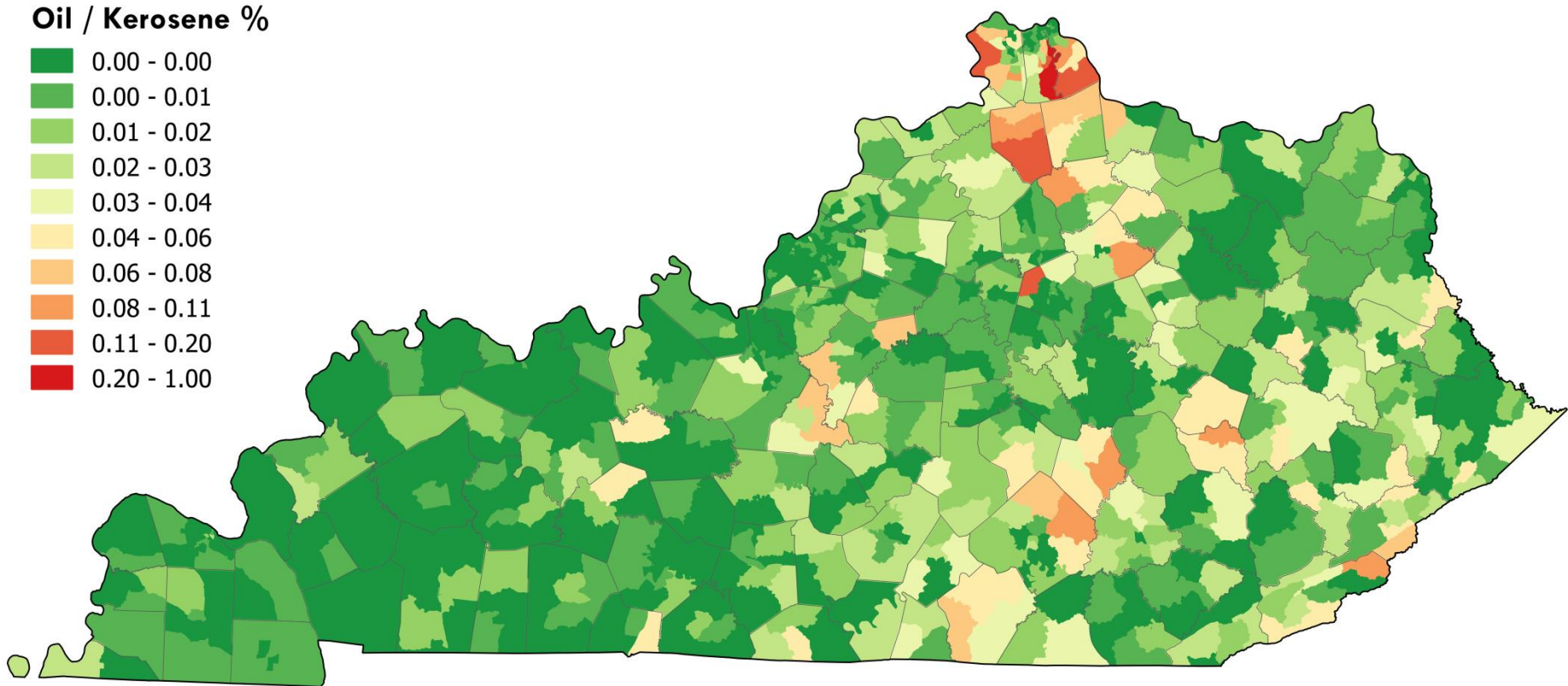


Kentucky Energy Database, EEC-DEDI, 2016

50,270 (2.9%) or Kentucky Families Heat with Wood



# Kentucky Homes Heating with Fuel Oil or Kerosene, 2014

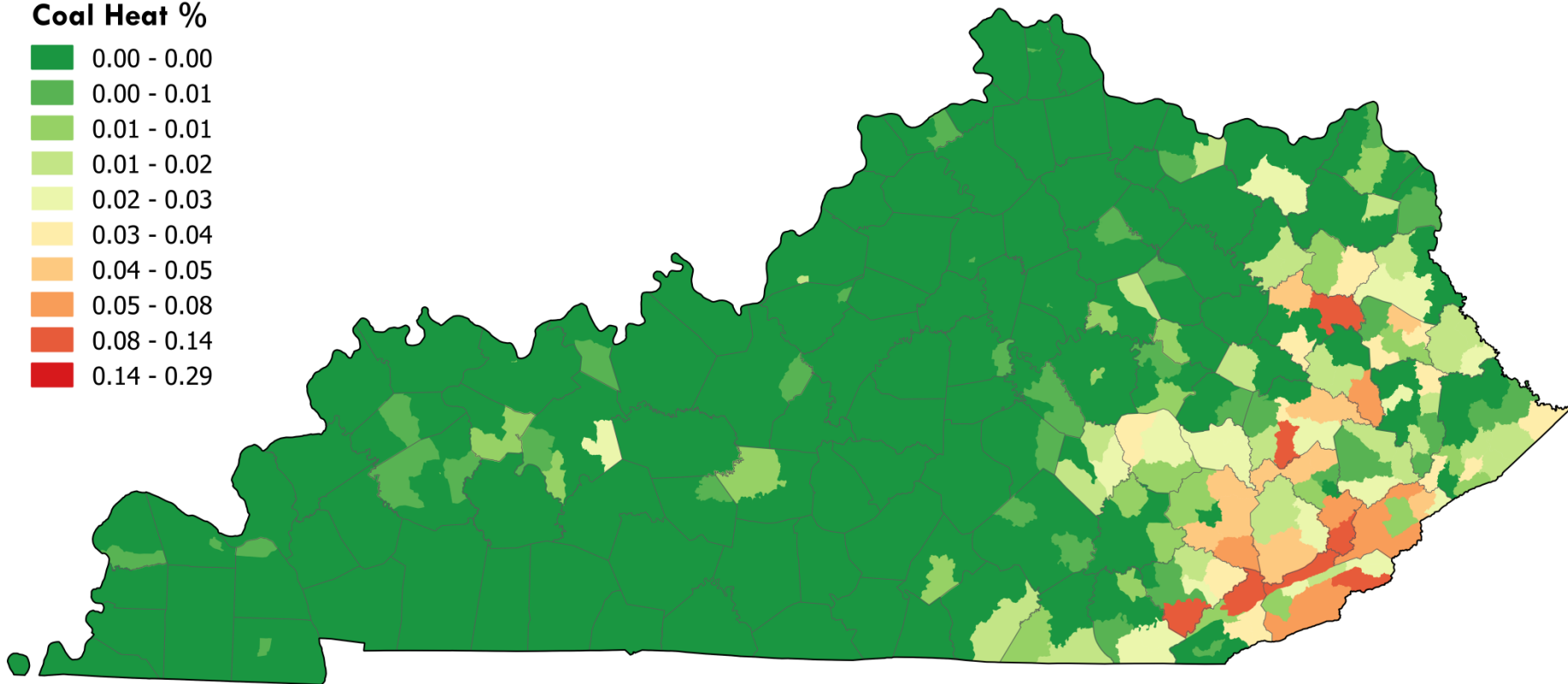
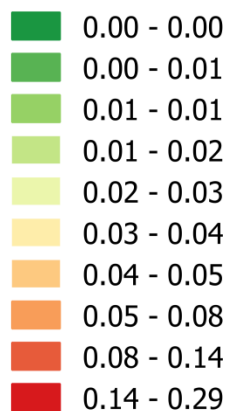


Kentucky Energy Database, EEC-DEDI, 2016

17,504 (1%) of Kentucky Families Heat with Fuel Oil or Kerosene

# Kentucky Homes Heating with Coal, 2014

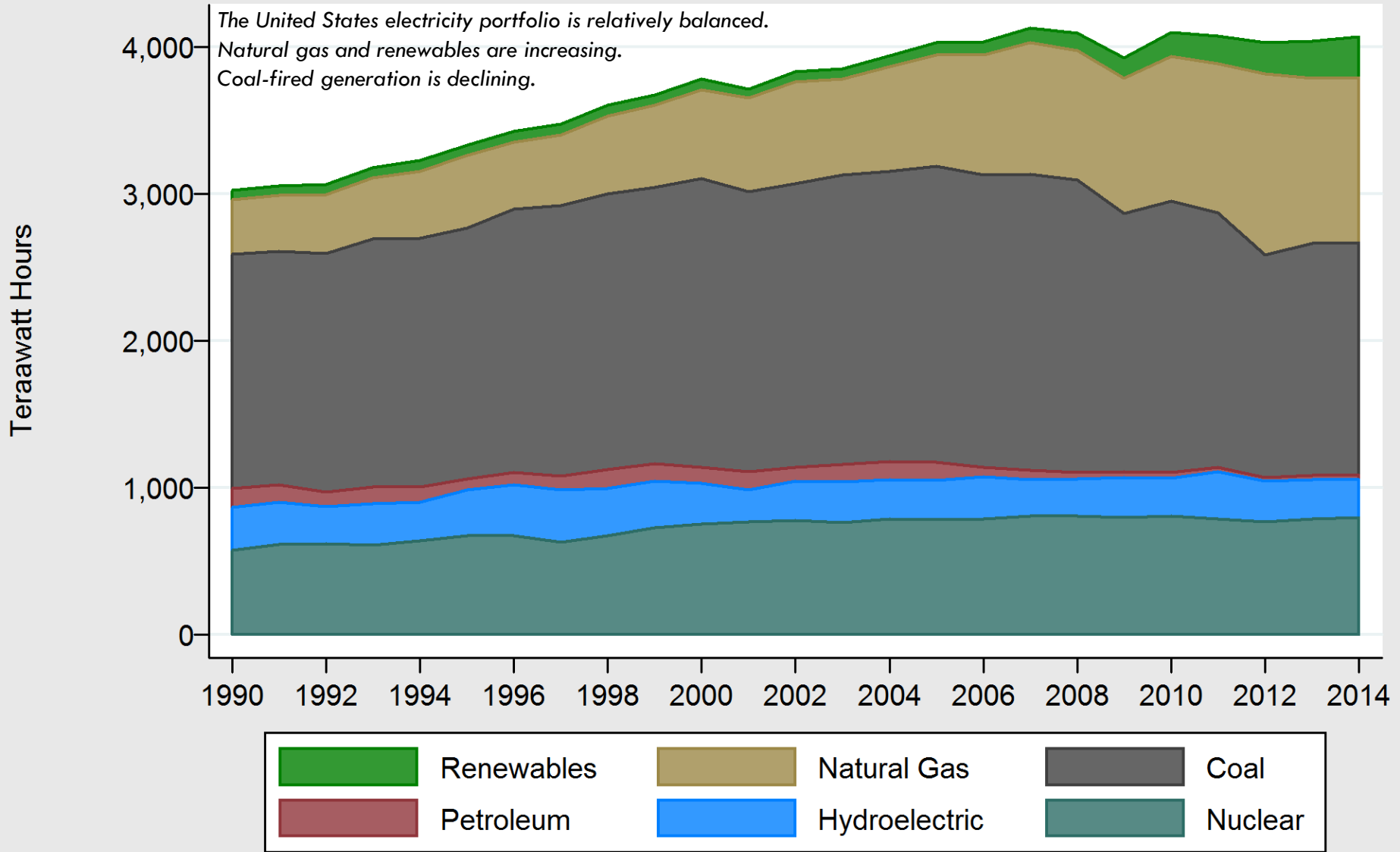
## Coal Heat %



Kentucky Energy Database, EEC-DEDI, 2016

4,317 (0.3%) of Kentucky Families Heat with Coal

# United States Electricity Generation by Fuel, 1990-2014

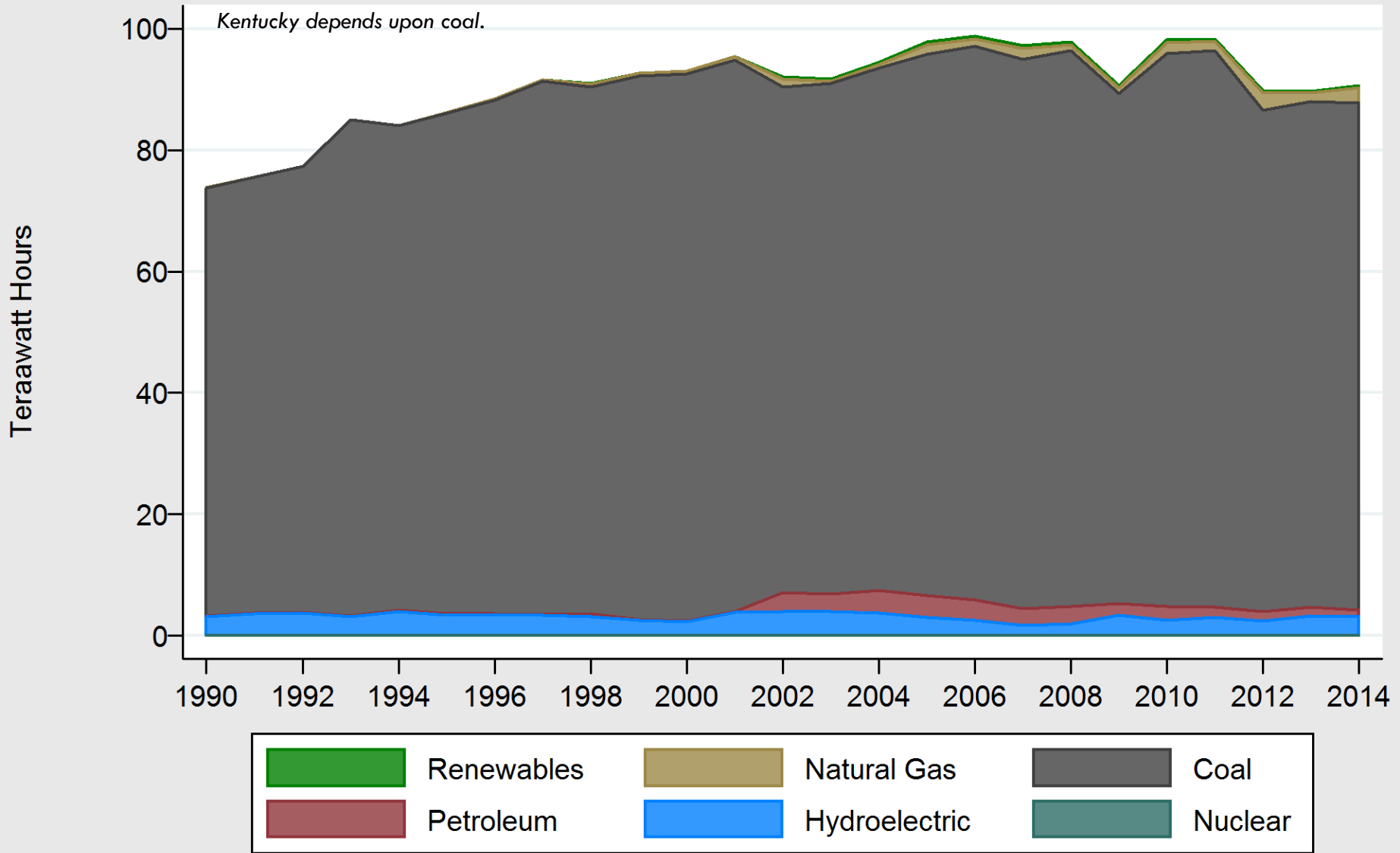


Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA Electric Power Annual



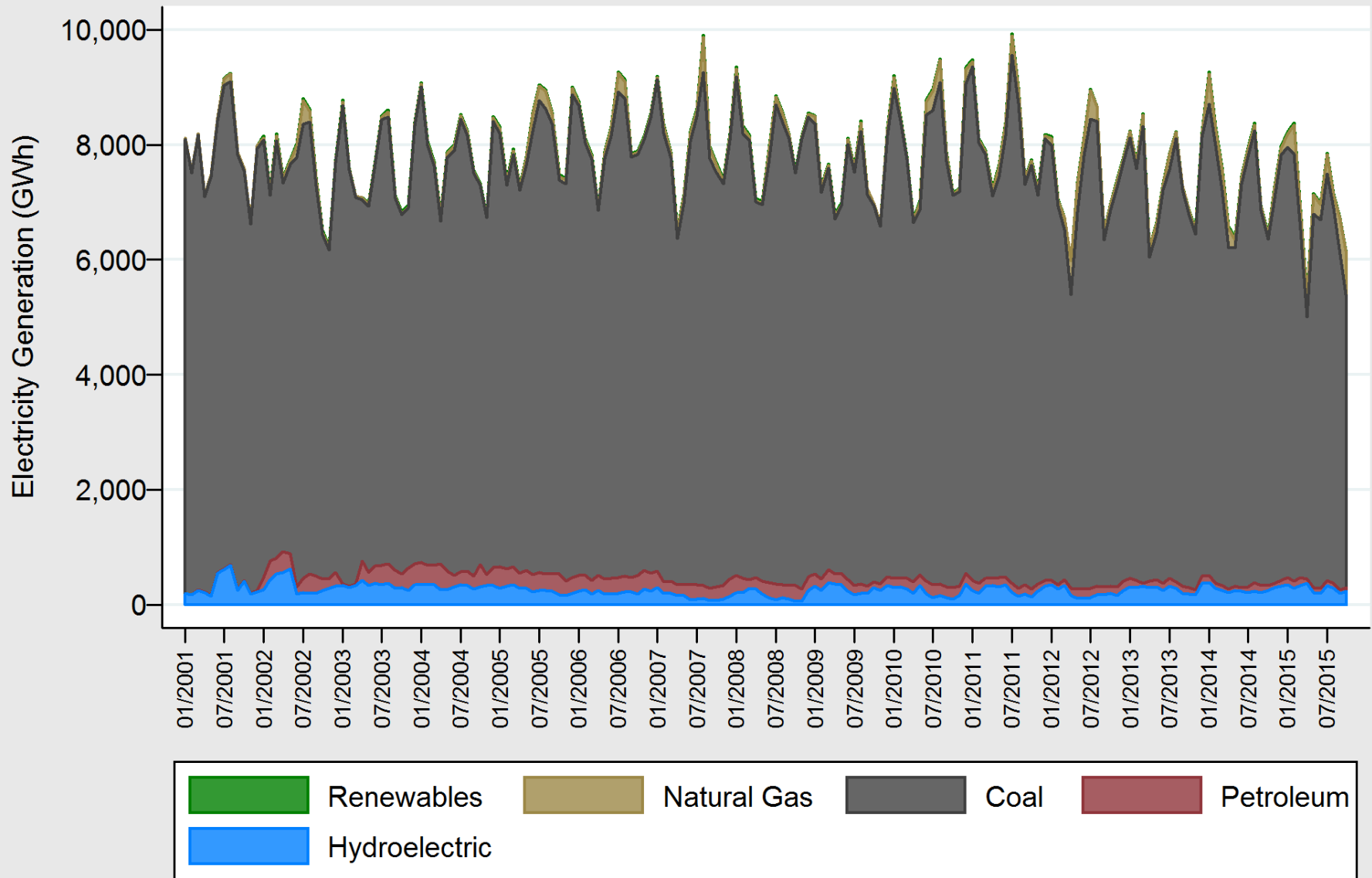
# Kentucky Electricity Generation by Fuel, 1990-2014



Kentucky Energy Database, EEC-DEDI, 2015

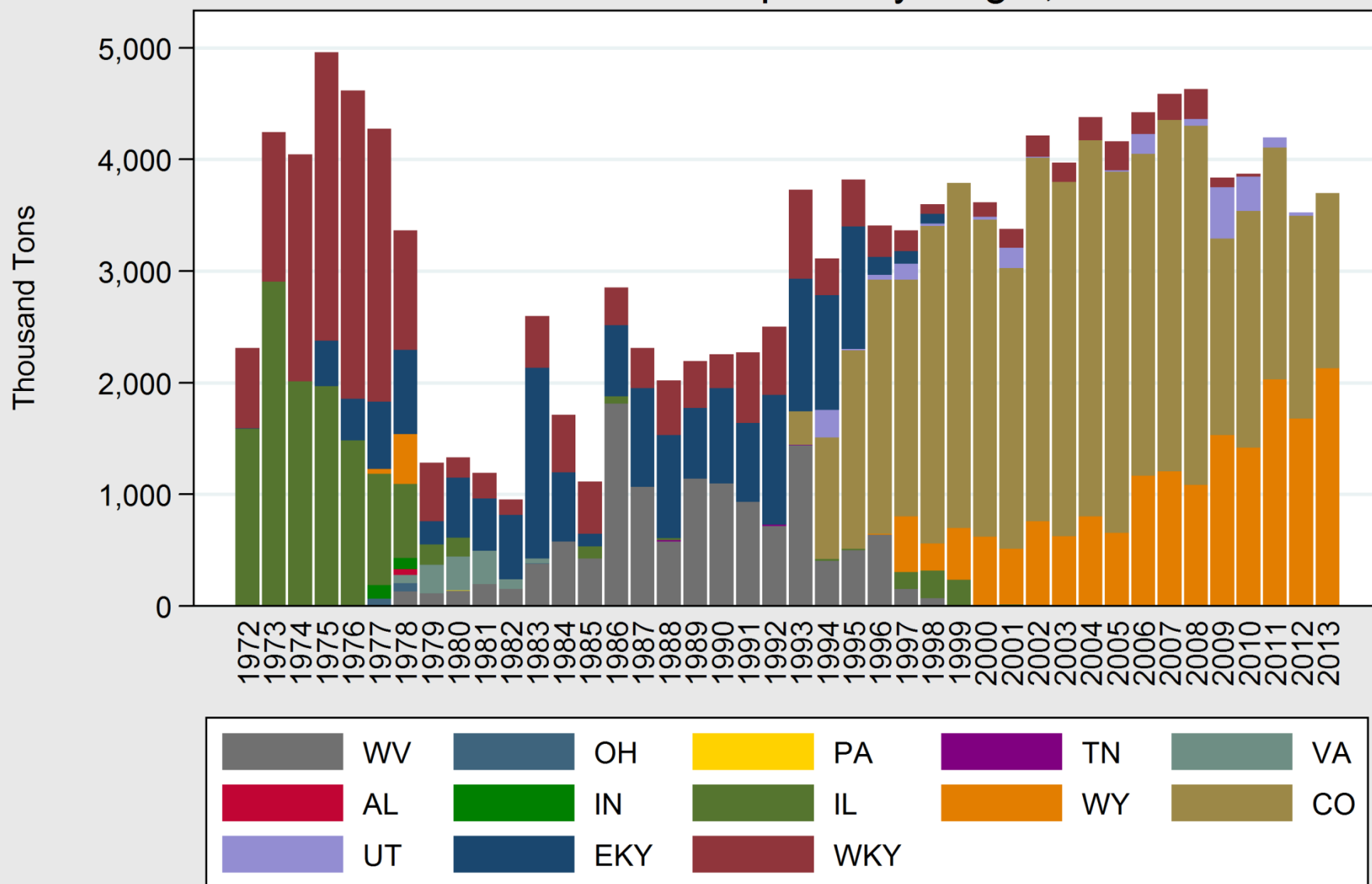
Data Source: EIA Electric Power Annual

## Kentucky Electricity Generation by Fuel Type, 2001-2015



Kentucky Energy Database, EEC-DEDI, January 2016

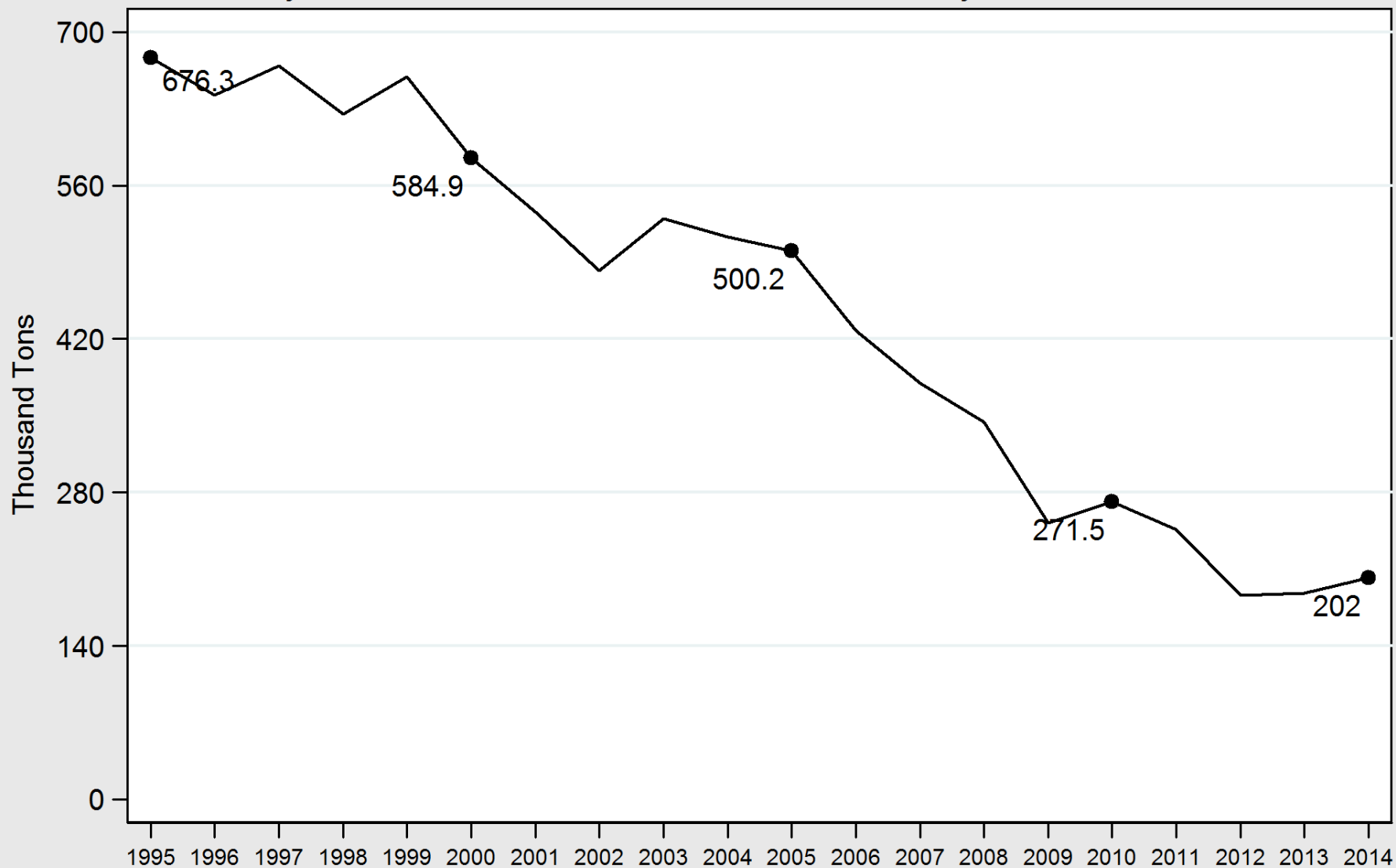
# Shawnee Coal Consumption by Origin, 1972-2013



Kentucky Energy Database, EEC-DEDI, 2015



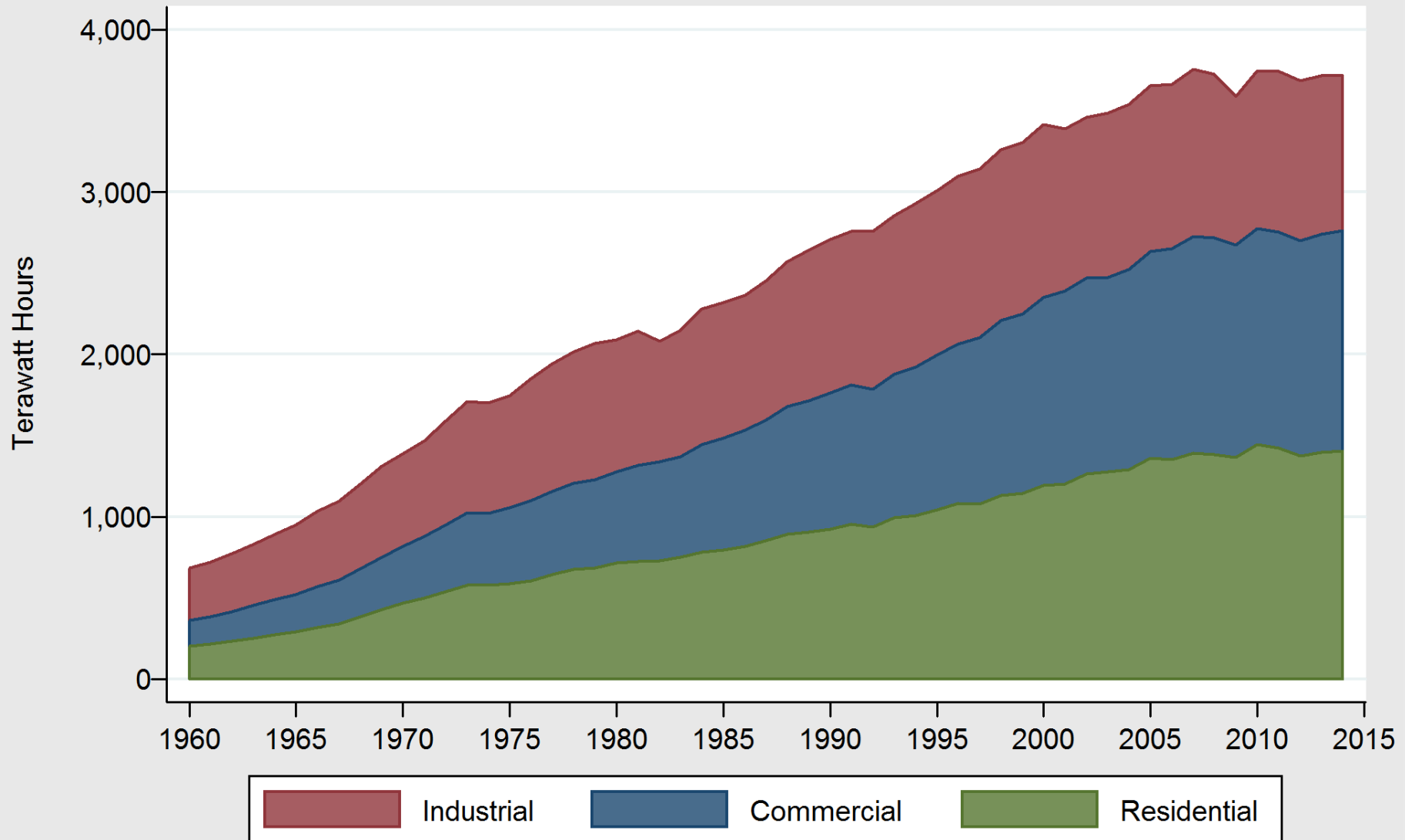
## Kentucky Sulfur Dioxide Emissions from Electricity Generation, 1995-2013



Kentucky Energy Database, EEC-DEDI, 2015

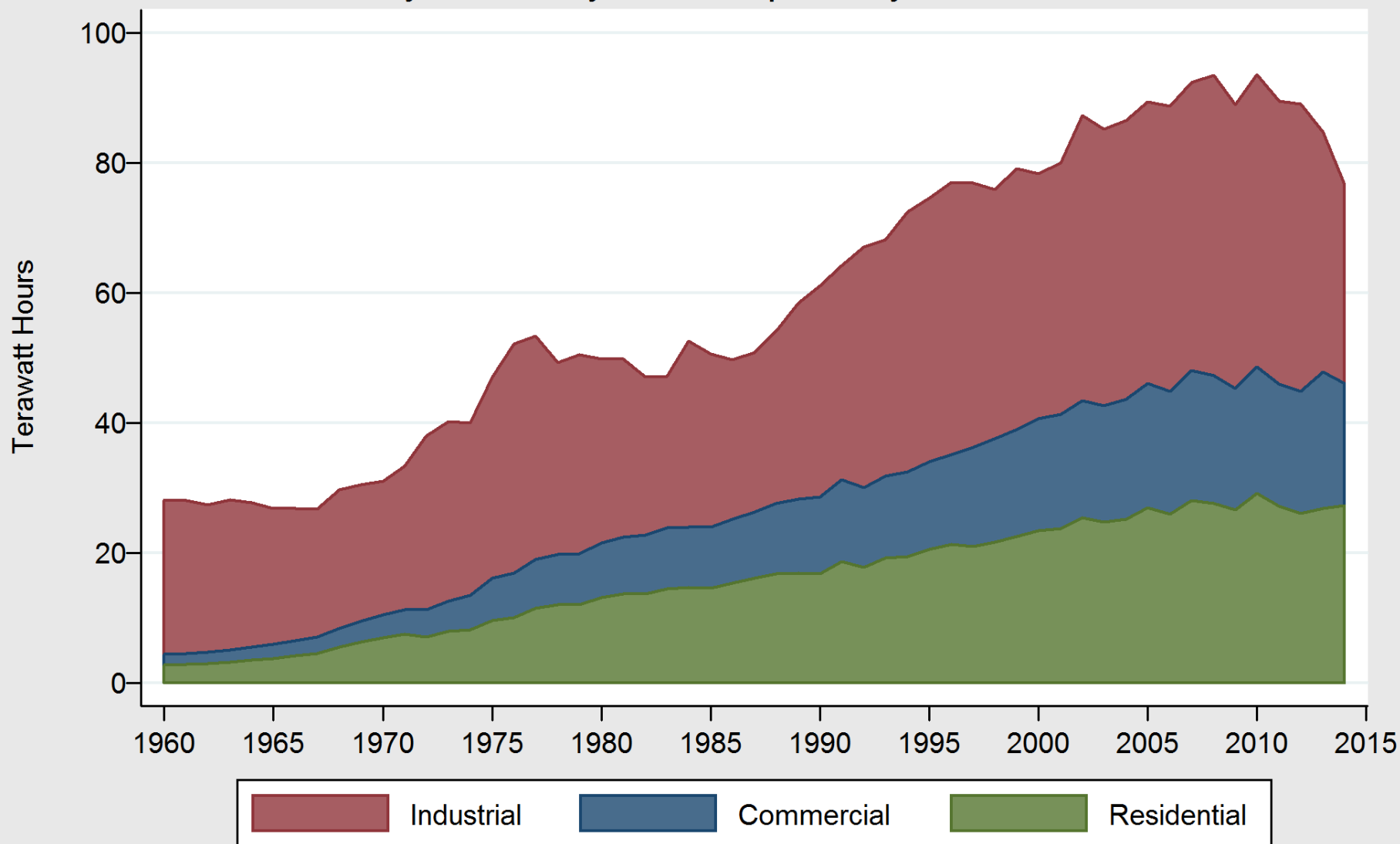
Data Source: EPA Clean Air Markets

# United States Electricity Consumption by Sector, 1960-2014



Kentucky Energy Database, EEC-DEDI, 2015  
Data Source: EIA SEDS & EIA Form 861 & 826

## Kentucky Electricity Consumption by Sector, 1960-2014



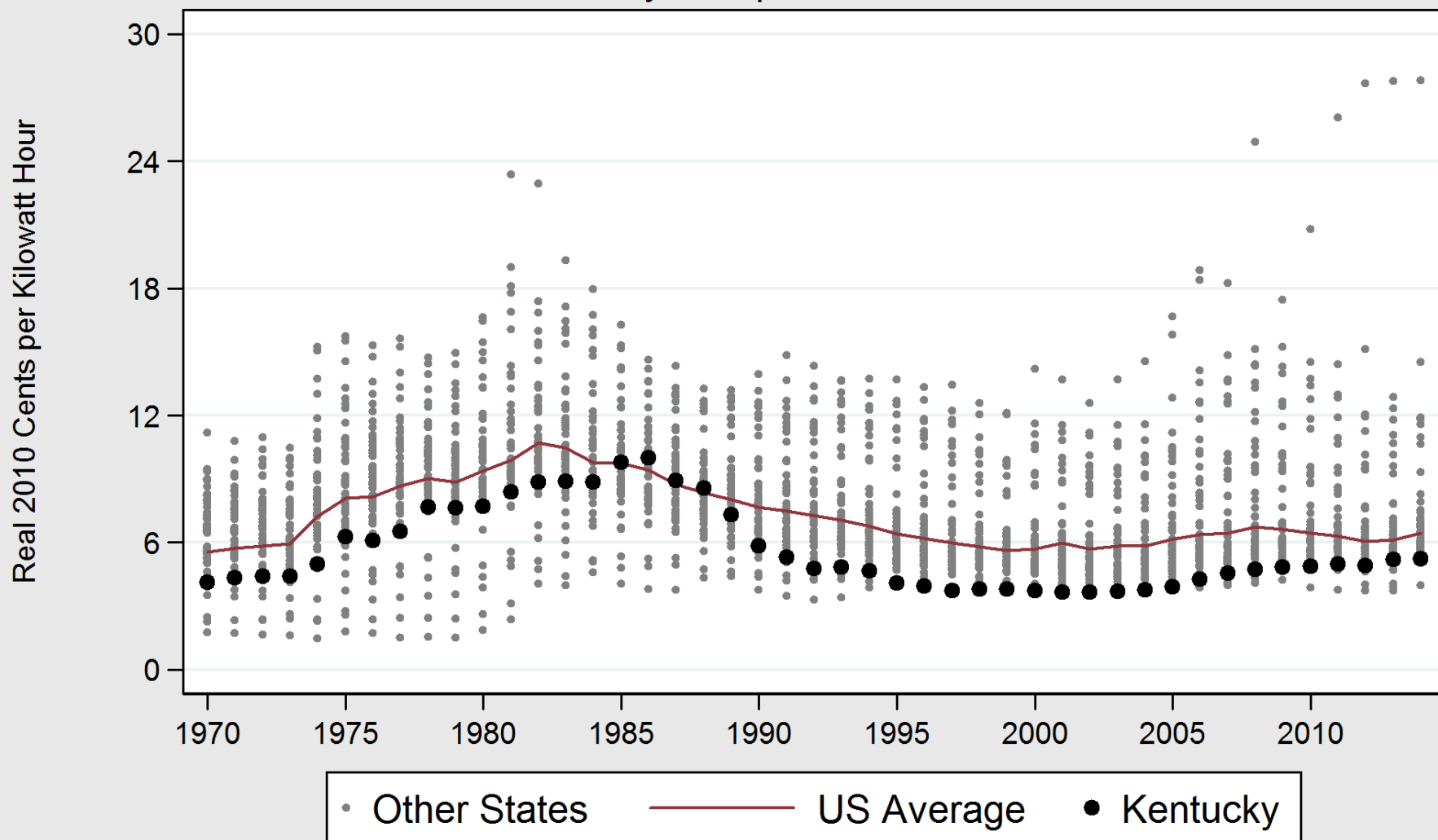
Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA SEDS & EIA Form 861 & 826



# Kentucky Average Real Industrial Electricity Price, 1970-2014

## Kentucky Compared to Other States

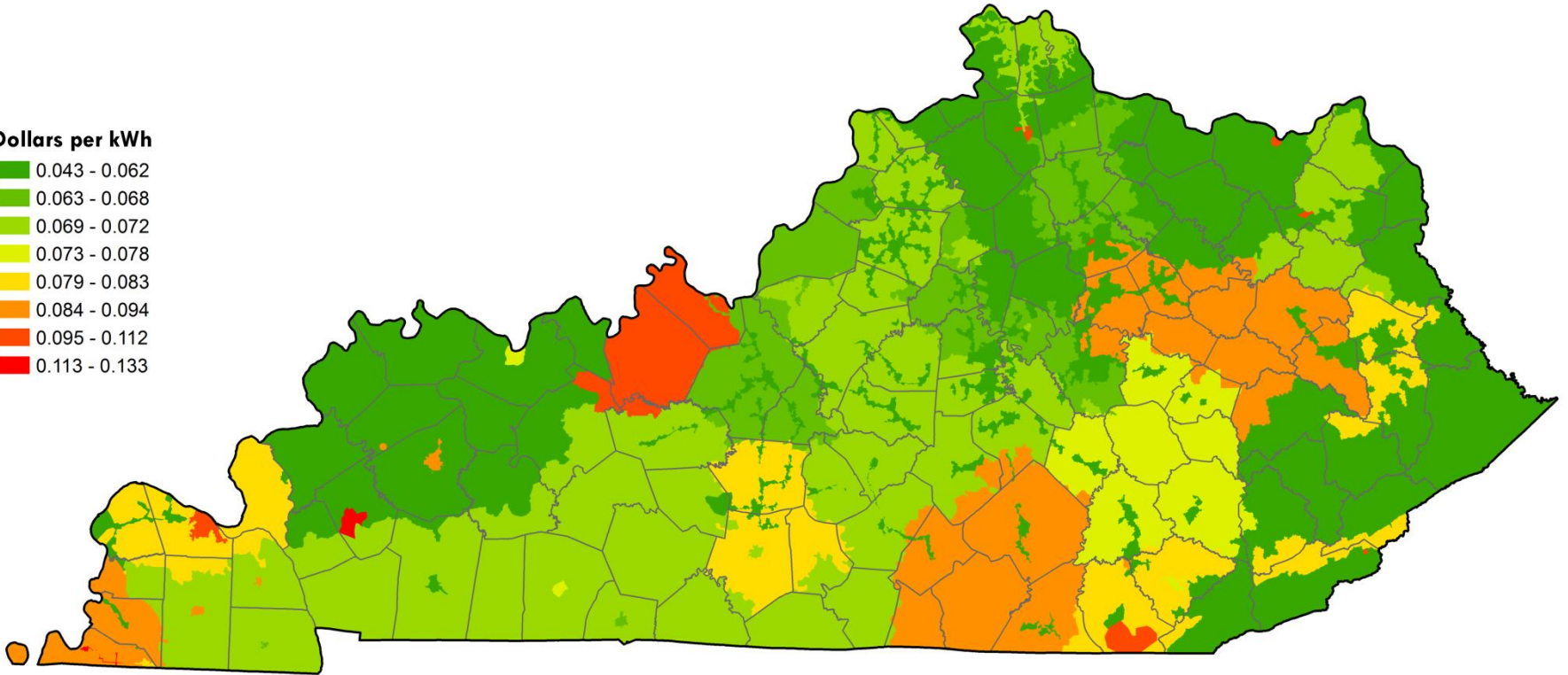
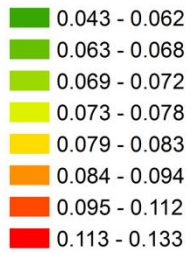


Kentucky Energy Database, EEC-DEDI, 2015

Data Source: EIA Form 861 & 826 & BEA

## Kentucky Industrial Electricity Prices, 2014

Dollars per kWh













CENTURY ALUMINUM SEBREE LLC

SPLR ID  
SPLR ASG (130) 174717525

LOT  
SERIAL # (S) 413-159-000837

ALLOY #

DIMENSIONS (INCHES)

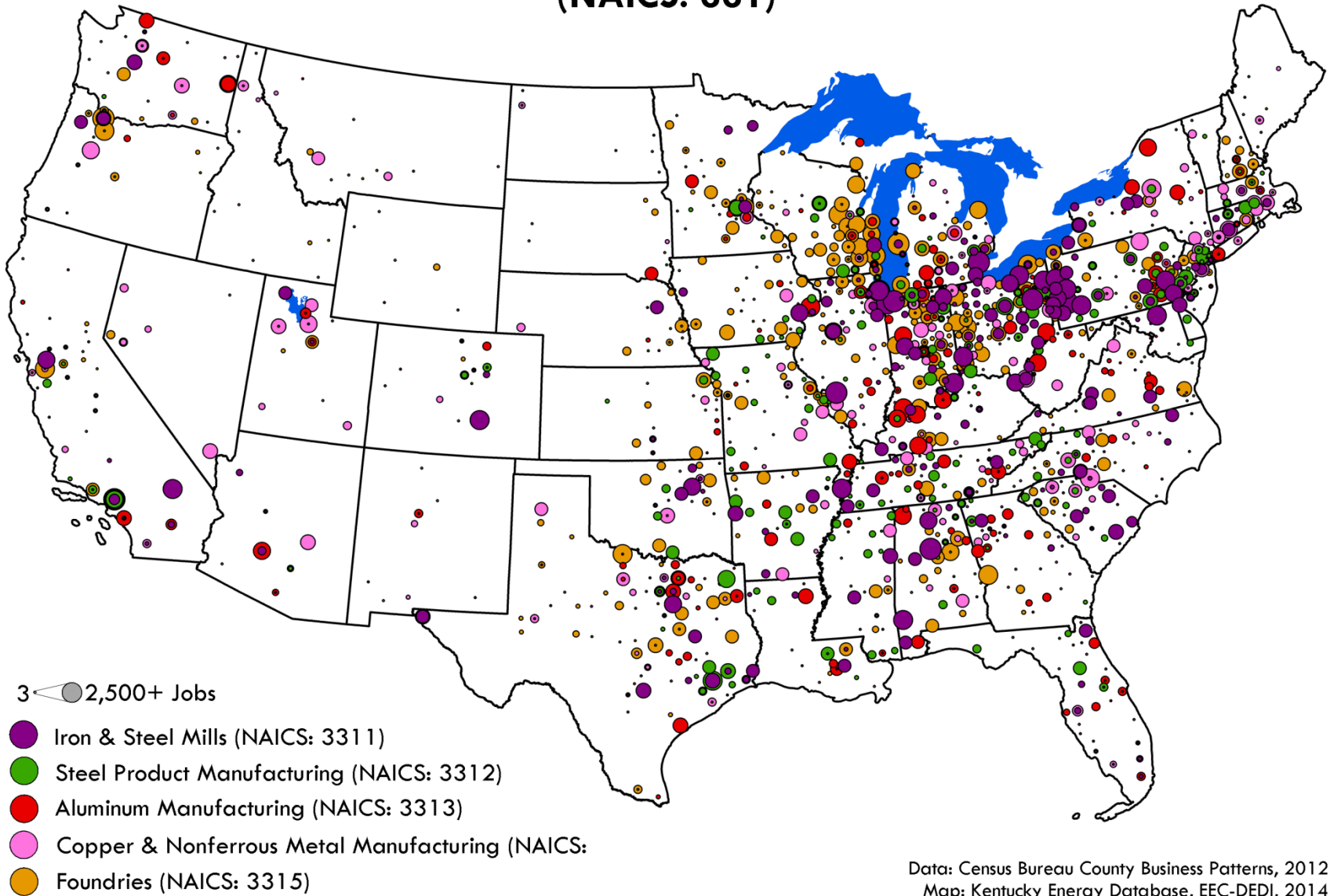
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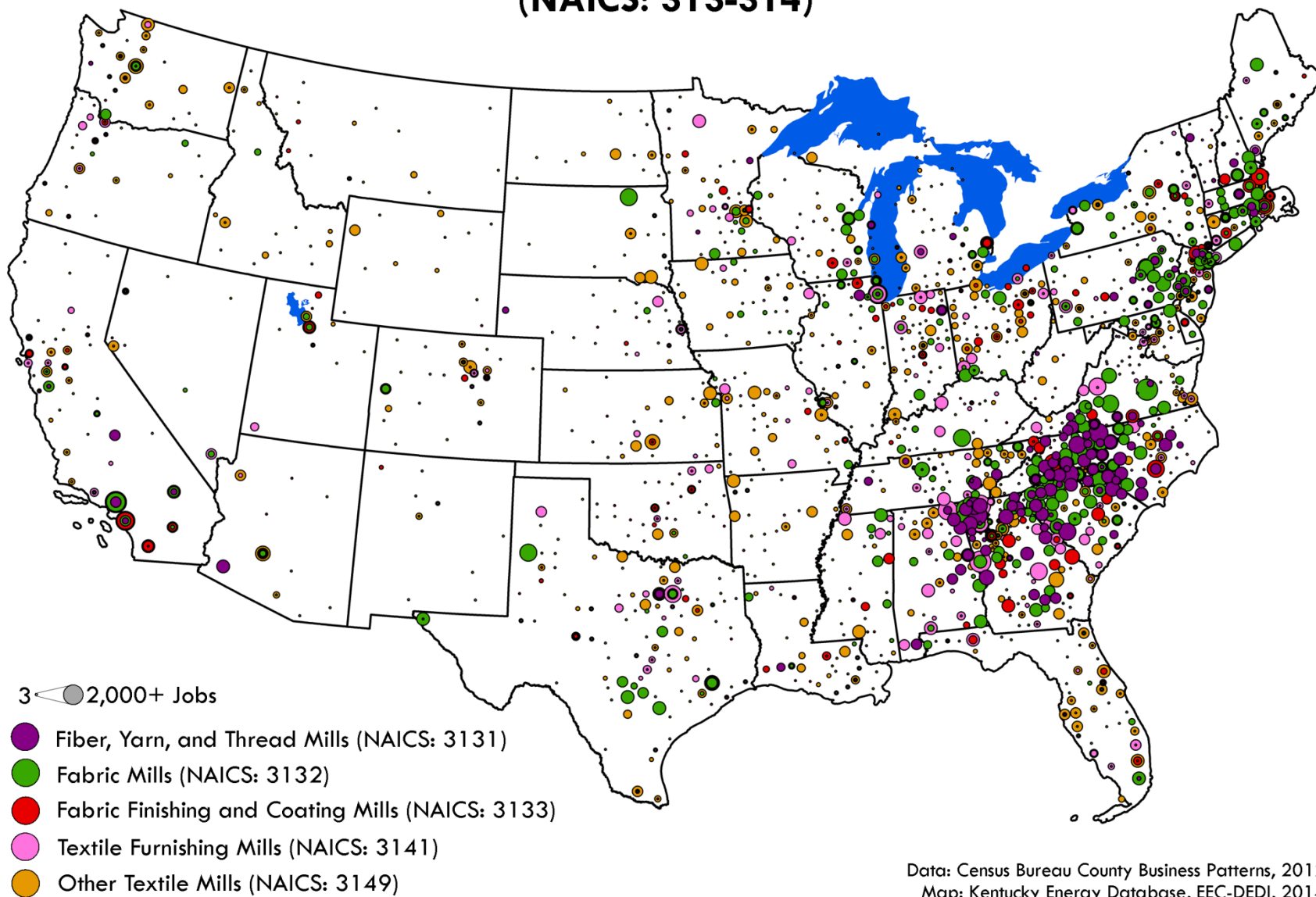
PRODUCED IN  
KENTUCKY, USA

Century Aluminum in Sebree, Kentucky in 2015

# United States Primary Metal Manufacturing Employment, 2012 (NAICS: 331)



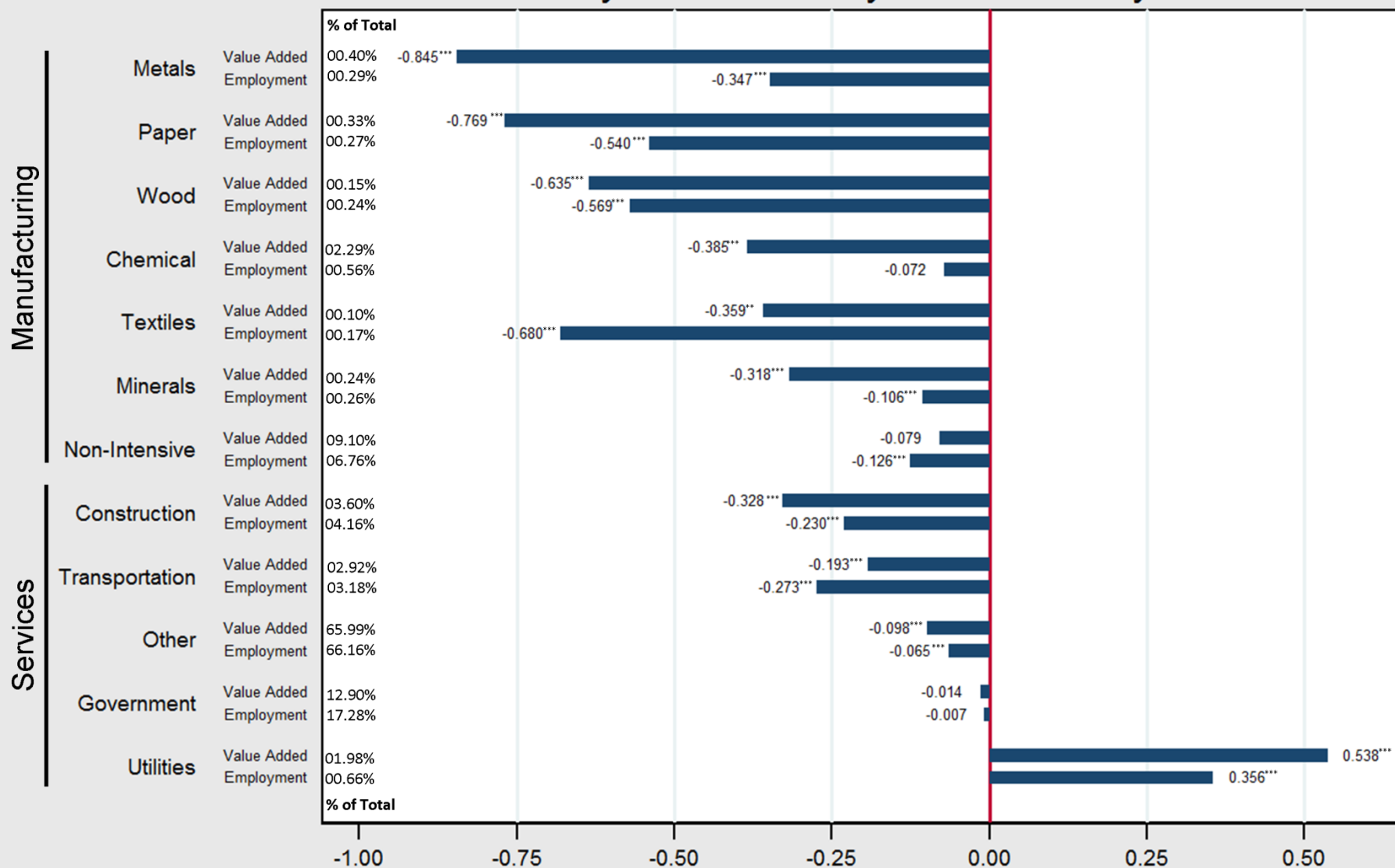
# United States Textile Manufacturing Employment, 2012 (NAICS: 313-314)



Data: Census Bureau County Business Patterns, 2012  
Map: Kentucky Energy Database, EEC-DEDI, 2014



# Electricity Price Elasticity Coefficients by Sector



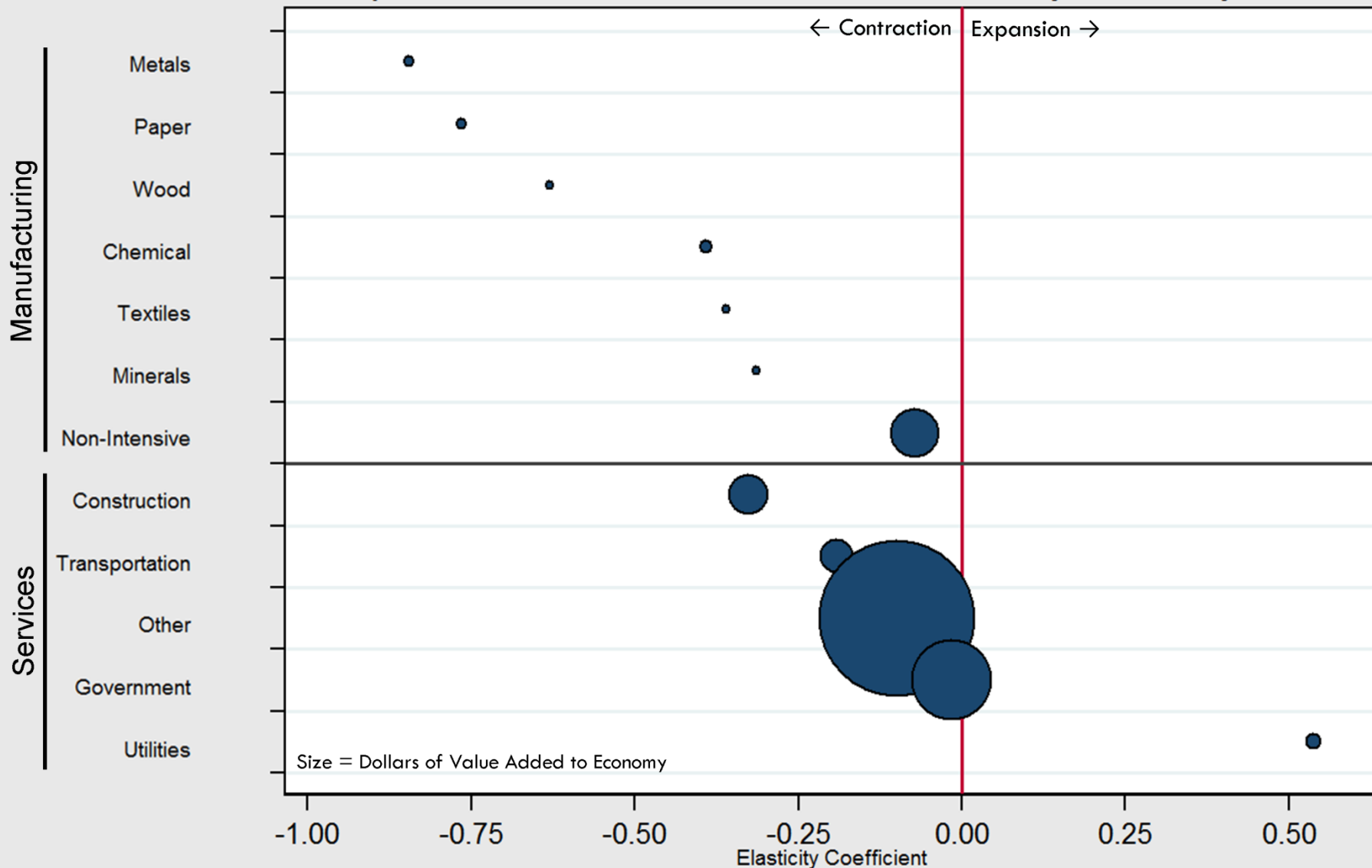
Kentucky Energy Database, EEC-DEDI, 2014

Elasticity Coefficient

Asterisk Denotes Statistical Significance at the Following Levels: \*  $P > |t| < 0.05$ , \*\*  $P > |t| < 0.01$ , \*\*\*  $P > |t| < 0.001$

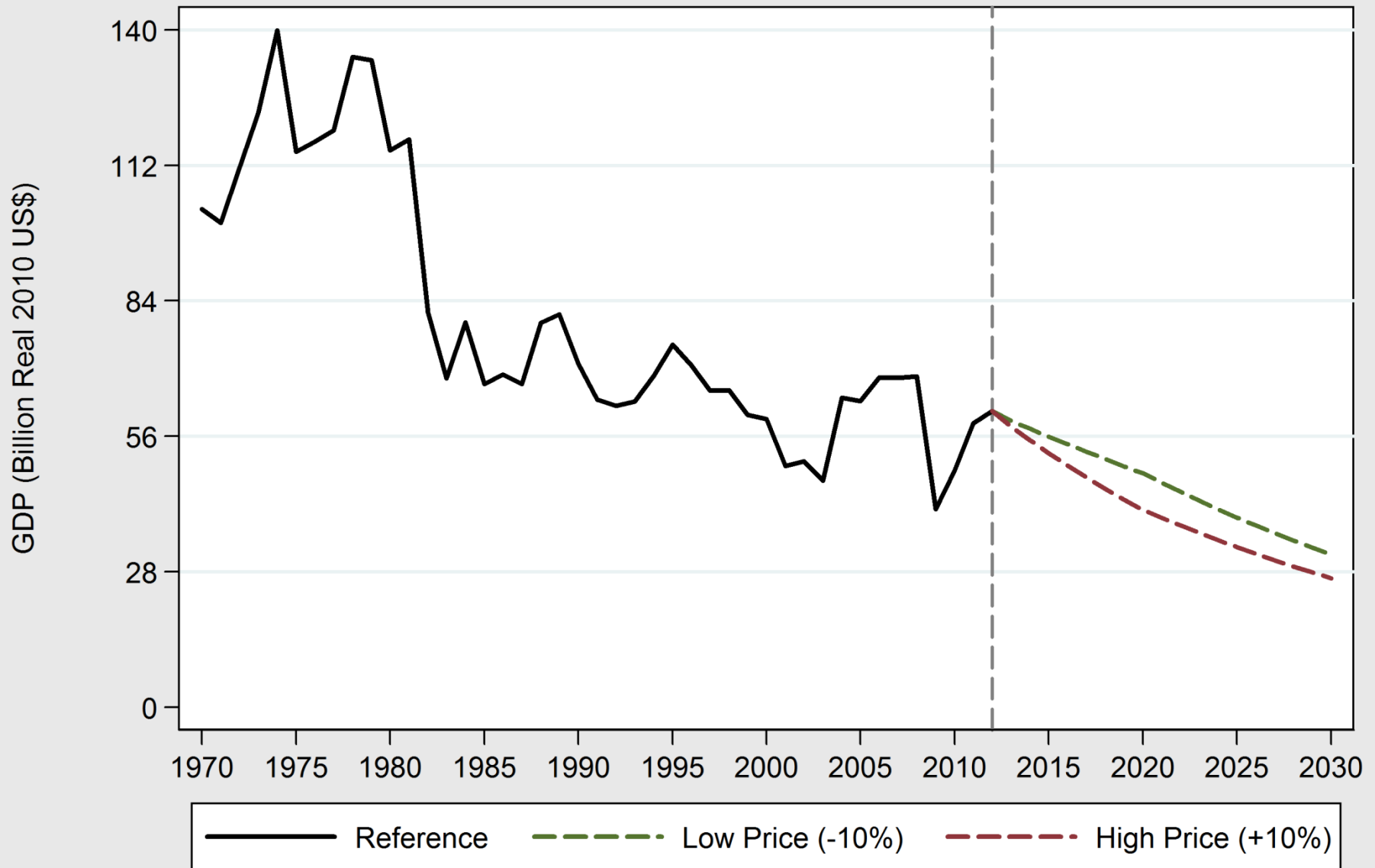


## Responsiveness of Value Added to Electricity Prices by Sector



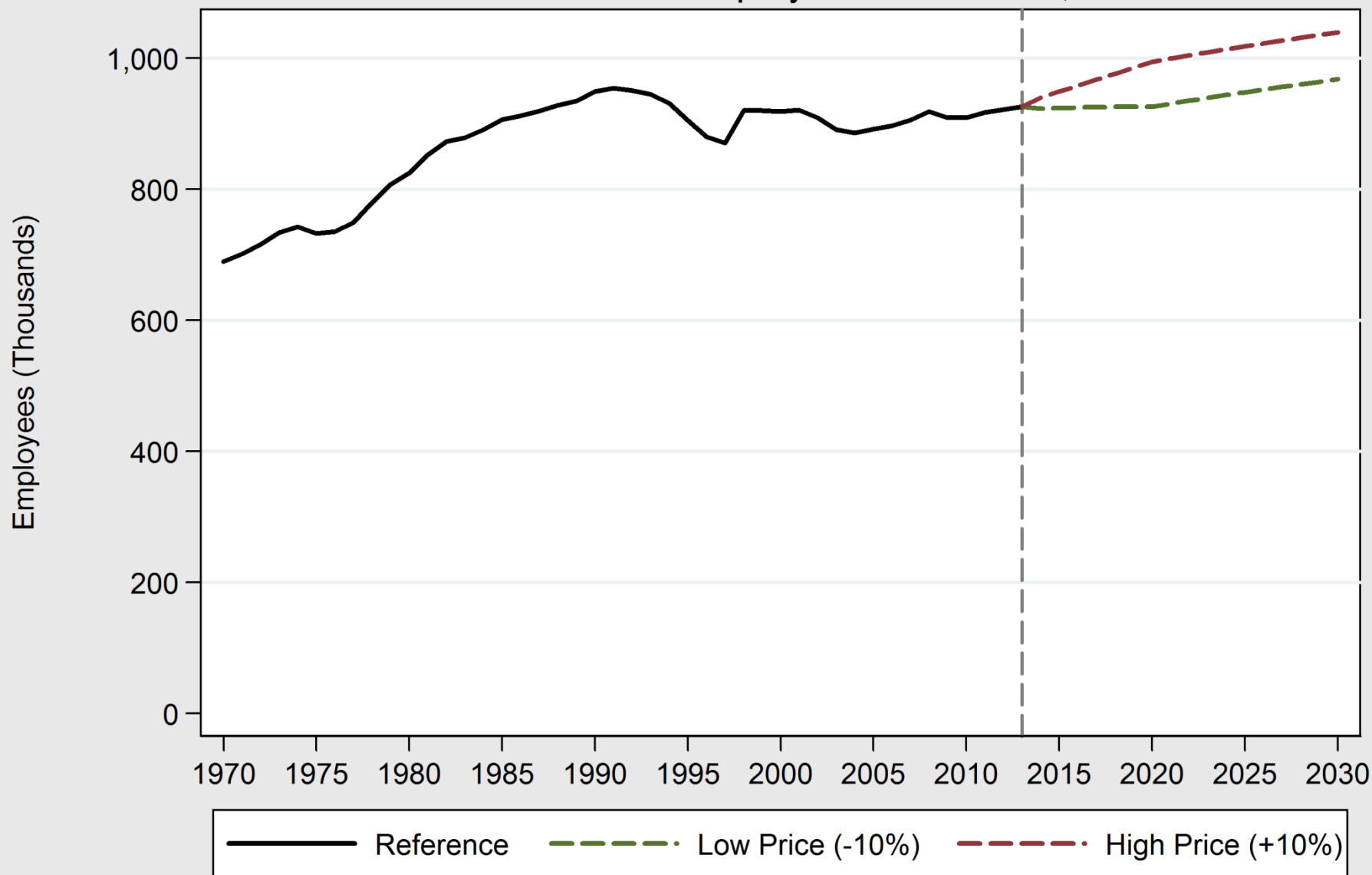
Kentucky Energy Database, EEC-DEDI, 2014

## United States Metals Real GDP Forecast, 1970-2030



Kentucky Energy Database, EEC-DEDI, 2014

## United States Utilities Employment Forecast, 1970-2030



Kentucky Energy Database, EEC-DEDI, 2014

# **The Vulnerability of the United States Economy to Electricity Price Increases**

The White Paper this Presentation is Based on is Available Online at:

<http://1.usa.gov/1aVhOWu>

An Interactive Excel Version of the Model is Available at:

<http://1.usa.gov/1G31BuN>



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